NPIC/D-152-70

8 JUN 1970

MEMORANDUM FOR:  Executive Director-Comptroller

THROUGH       :  Chairman, Information Processing Board

SUBJECT       :  Request for Approval of a Contract for a
                 Diagnostic Computer Program for the High
                 Precision Stereo Comparator _____      25X1
                                                           25X1


1.  This memorandum requests approval for the commit-
ment of R&D funds for a NPIC contract.  The specific request
is stated in Paragraph 8.

2.  The High Precision Stereo Comparator (HPSC), which
is presently under development, is scheduled to become oper-
ational by the end of 1970.  This sophisticated comparator
provides stereoscopic measurements accurate to a fraction
of a micrometer (micron).  This extremely complex, computer
controlled, optical-electromechanical device is precision
engineered; however, as with every manmade device, trouble-
shooting and maintenance will be required from time to time
to determine causes of failure as well as for keeping all
of the components of the system in good operating order and
in proper alignment.  Regularly scheduled preventive mainte-
nance checks will have to be made in order to be assured
that the comparator and its numerous interrelated systems
and subsystems are functioning as required.  This will ensure
that consistent and accurate data is provided.  Since the
comparator system is so complicated and requires skills in
several specialized fields to diagnose subsystem failures,
NPIC maintenance personnel have requested that the Research
& Engineering Division develop a Diagnostic Routine to help
cope with this problem.  The proposed routine will be pro-
grammed into the HPSC's internal computer, a DDP-516, and
utilized to perform certain exercises to allow maintenance
personnel to quickly locate any problem areas and to help
isolate the specific subsystem or subsystems involved.  This
program will provide a means to check out and verify the
forty subsystems of the HPSC in one-tenth the time required

SECRET

SUBJECT:  Request for Approval of a Contract for a Diagnostic
          Computer Program for the High Precision Stereo
          Comparator[                                    ]  25X1
          [                                            ]       25X1

for a manual check-out procedure (1/2 to 1 hour versus 10
hours).  Utilizing this scientific approach, repairs and/or
alignments can be made with a minimum of down time for the
HPSC.  Furthermore, variation of this routine can be used,
at regularly scheduled intervals, to perform complete pre-
ventive maintenance checks.  Additionally, the operator
can also check the relative stereoscopic orientation;
that is, the positions of the instrument's optical trans-
formation elements with regard to a set of test stereograms.
The routine is such that this can be done easily and quickly
at the beginning of each daily operation.

        3. [                                   ] the prime contractor    25X1
for the HPSC, has proposed a seven-to-ten month program
directed toward developing two series of diagnostic computer
routines designed to provide a rapid and controlled technique
for operating all computer directable elements of the HPSC
on an individual basis.  The routine will lead the mainten-
ance technician--through a question and answer technique--to
perform the necessary functions requiring his attention.  The
diagnostic program will exercise all the mechanical moving
subassemblies throughout their ranges at a variety of speeds.
The technician will be able to observe the position of the
readout dials on the control console and visually inspect the
optical system through the eyepieces.  He will also directly
observe the operation of the various electromechanical drives.

        4. Some slight hardware modifications and the addition
of circuitry to gain access to otherwise unavailable elec-
tronic signals will be required.  The contractor also pro-
poses to design, write, and prepare the two series of diagnos-
tic computer programs.  He will deliver a punched paper tape
of the programs and add a manual switching panel to the com-
parator.  Since this diagnostic routine is to be developed by
the NRI engineers having the most intimate knowledge of the
equipment, the undertaking is considered to have minimum
technical risk.  The question is not of whether the routine
will work, but rather of how well and how simply it can be
made to function.

        5.  The Diagnostic Computer Program will provide an
error analysis capability for a unique High Precision Stereo

2

SECRET

SUBJECT:    Request for Approval of a Contract for a Diagnostic
            Computer Program for the High Precision Stereo
            Comparator [                                      ]    25X1
                                                                    25X1

comparator built [              ] is the only contractor with an    25X1
intimate enough knowledge of the equipment to develop the
routine; hence, this is a sole source item.

        6.  No follow-on or continuation of this program is
anticipatd.  The project has been coordinated with Technical
Services & Support Group/Engineering Support Division, Imagery
Exploitation Group/Photogrammetry Division, and Production
Support Group/Automated Information Division.

        7.  The security classification of this contract will
be CONFIDENTIAL.  The association is CONFIDENTIAL, and the
title is UNCLASSIFIED.

                                                                    25X1

                        ARTHUR C. LUNDAHL
                              Director
            National Photographic Interpretation Center

Attachments:                                                        25X1
    1.  Proposal        CONCUR
    2.  Form 2420
                                                    Intelligence    25X1

                                                         1 June 70
                                                            Date
CONCUR:

APPROVE                                                  11 June 70
                                                            Date

SUBJECT:  Request for Approval of a Contract for a Diagnostic
          Computer Program for the High Precision Stereo
          Comparator                                          25X1
                                                              25X1


Distribution:
    Original  - Exec. Dir.-Compt., return NPIC
           1  - Exec. Dir.-Compt.
           1  - Chairman, IPB
           1  - DDI/IPC
           2  - NPIC/ODir
           1  - NPIC/TSSG
           1  - NPIC/TSSG/RED

4

REQUEST TO PROCUREMENT DIVISION FOR SERVICES
*(other than property or building maintenance and repairs)*

| OFFICE/DIV/BR | REQUEST NO. | DATE OF REQUEST | I CERTIFY TH ESTIMATE 25X1 |
|---|---|---|---|
| NPIC/TSSG/RED | 5500-6111-70 | 25 May 70 | AMOUNT OF $ _____ ARE AVAILABLE. CHARGE TO FAN 0155-5340 |

| PROJECT TITLE | PROJECT OR CONTRACT OFFICER EXTENSION | 25X1 |
|---|---|---|
| Diagnostic Computer Program | | |

PROPOSAL NO. AND DATE

13 March 1970

25X1

25X1

| TYPE OF SERVICE REQUESTED | APPLICABLE ONLY TO REPAIRS AND MODIFICATIONS |
|---|---|

| | TECHNICAL INSPECTION IS REQUIRED BY |
|---|---|
| X RESEARCH/DEV | ☐ RECEIVING DEPOT T & I   ☒ TECHNICAL MONITOR |
| GRANT | TRANSFER OF FUNDS TO OTHER GOVT. AGENCY *(specify if applicable)* ☐ ITEMS TO BE PICKED UP OR ☐ SERVICES PERFORMED AT: |
| REPAIR | |
| MAINTENANCE | ITEMS TO BE REDELIVERED TO: |
| MODIFICATION | |

| STERILITY | CONTRACT CLASSIFICATION | WORK CLASSIFICATION | HARDWARE CLASSIFICATION | REPORTS CLASSIFICATION |
|---|---|---|---|---|
| | CONFIDENTIAL | UNCLASSIFIED | UNCLASSIFIED | UNCLASSIFIED |

25X1

SHORT SUBSTANTIVE TITLE AND/OR DESCRIPTION OF SERVICE TO BE PERFORMED

Diagnostic Computer Program for the High Precision Stereo Comparator (HPSC)

*(See reverse for specific information required on R&D requests.)*

APPROVAL

| DESIGNATION | SIGNATURE | DATE |
|---|---|---|
| SA/TSSG | | 25X1 |
| C/SS.D/TSSG/N | | 6-16-70 |

PROCUREMENT DIVISION USE

| DATE RECEIVED IN PD | RECORDED BY | SECTION ASSIGNED TO | NEGOTIATOR |
|---|---|---|---|
| | | | |

FORM 2420 REPLACES FORMS 2420 AND 2416
3-67

The builder of the HPSC is the only contractor with enough
intimate knowledge of the equipment to assemble the Diagnostic
Computer Program.

## 2. PROPOSAL

Attached

## 3. DELIVERABLE ITEMS

REPORTS REQUIRED      __5__  NO. OF COPIES  ☒ MONTHLY   ☐ INTERIM   ☐ QUARTERLY   ☐ FINAL

HARDWARE (state type and number) Required components to modify HPSC
    Six (6) copies of instruction manual for use of Diagnostic Computer Prog
OTHER One (1) or more punched paper tapes of comparator program
    One (1) copy of a computer generated "listing" of the Diagnostic
    Program, including flowchart diagrams of this computer program.

## 4. GFE REQUIRED

Requires use of HPSC, and a pair of stereo test photographs
described in attached proposal.

## 5. SPECIAL INSTRUCTIONS